



Department of Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

February 7, 2003

Mr. Daniel W. Felton
Environmental Compliance Services, Inc.
588 Silver Street
Agawam, Massachusetts 01001

Re: Torch System (Glow Discharge Plasma)

Dear Mr. Felton:

The Bureau of Petroleum Storage Systems (Bureau) hereby accepts Torch System (Glow Discharge Plasma) as a product for ex situ remediation of petroleum and other suitable contaminants in groundwater. Although this acceptance applies only to the jurisdiction of this Bureau, other Bureaus within the Department of Environmental Protection, or other state agencies and local governments may choose to recognize it if their needs and regulations are similar. This Bureau, however, is not responsible for applications beyond its jurisdiction.

The Bureau recognizes Torch System as a viable method for the remediation of petroleum and other suitable types of contaminated sites in Florida. There are no objections to its use provided a Remedial Action Plan is submitted pursuant to Chapter 62-770 Florida Administrative Code (F.A.C.), for approval by the Department. Furthermore the effluent must meet applicable groundwater standards set forth in Chapters 62-777, 62-520, and 62-550, F.A.C.

As indicated in your literature, the Torch System (Glow Discharge Plasma) is a device for the ex situ treatment of groundwater contaminated by petroleum, metals, and other suitable organic and inorganic contaminants. It uses a strong electric field to create low temperature plasma, whose electrons collide with molecules on the surface of water and in the water vapor of a falling film reactor. The water molecules break apart into reactive OH and H radicals that destroy the contaminants by oxidation and reduction, respectively. Enclosure 1 contains additional information that the Bureau would like to pass along to readers of this letter.

While the Department of Environmental Protection does not provide endorsement of specific brand name remediation products or processes, it does recognize the need to determine their acceptability from an environmental standpoint with respect to applicable rules and regulations, and the interests of public health, safety, and welfare. Vendors must then market the products and processes on their own merits regarding performance, cost, and safety in comparison to competing alternatives in the marketplace. In no way, however, shall this regulatory acceptance letter be construed as a certification of performance.

Those who prepare Remedial Action Plans are advised to include a copy of this letter in the appendix of plans they submit, and call attention to it in the text of their document. In this way, technical reviewers throughout the state will be informed that you have contacted the Department of Environmental Protection to inquire about the environmental acceptability of this process.

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The Department reserves the right to revoke its acceptance of any product or process if its nature, performance, or any other aspect has been falsely represented. Additionally, Department acceptance of a product or process does not imply it has been deemed applicable for all cleanup situations, or that it is preferred over other treatment or cleanup techniques in any particular case.

A site-specific evaluation of applicability and cost-effectiveness must be considered for any product or process, whether conventional or innovative, and adequate site-specific design details must be provided in a Remedial Action Plan. You may contact me at 850/877-1133 ext. 29 if there are any questions.

Sincerely,

Dona J. Milinkovich, Ph.D.
Ecology and Environment, Inc.
Bureau of Petroleum Storage Systems
Petroleum Cleanup Section 6

Rebecca Marx
FDEP Section Leader
Bureau of Petroleum Storage Systems
Petroleum Cleanup Section 6

/djm

enclosures

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ENCLOSURE 1
ADDITIONAL INFORMATION ABOUT THE TORCH SYSTEM (GLOW DISCHARGE PLASMA)

Environmental Compliance Services provided most of the information below. The Bureau of Petroleum Storage Systems obtained additional information from the literature, equipment manufacturers, and the Florida Administrative Code.

1. Technology Description: Contaminated water is treated in a reactor (Falling Film GDP reactor) by an electric discharge initiated above the fluid bed at ambient temperatures. A strong electric field is developed between unlike electrodes, one within the fluid phase and one within the gas phase. The electric field accelerates electrons in non-thermal plasma, which is an electrically neutral gas that has very energetic electrons. The contaminated water is circulated in a falling film within the reactor. The fast moving electrons in the plasma collide with molecules in the water and on the water's surface. This activity breaks the molecules apart, forming reactive radical and ions that destroy the contaminants.
2. Treated Water: Enhanced biocide and chemical activity of treated water has been demonstrated. This activity may aid in preventing the fouling of conventional treatment units, act as a catalyst for chemical reactions, increase in situ solubilization and recovery of organic contaminants and/or the rate of in situ chemical destruction, or provide a vehicle for subsurface delivery of remediation aids (oxidizing agents, solvents, etc.). Please note, however, that the effluent must meet groundwater criteria pursuant to Chapters 62-777, 62-520, and 62-550 F.A.C.
3. Design: The 4-ft. diameter portable reactor is capable of treating approximately 100 gpm. Based on designs provided by The Department of Energy's Pacific Northwest National Laboratories, the reactor consists of a water inlet, a water outlet, a sump pump, an electrode bus with six electrodes (site of plasma discharge), and 176 flow tubes (each 1.75" diameter) forming flow chambers within the compartment wall.
4. Safety: The Department provides a reminder that the onus shall be on the user regarding the safety precautions utilized when the Torch System (Glow Discharge Plasma) is used at remediation sites in Florida. The Department expects appropriate safety precautions to be taken with respect of electrical and fire safety, reactor operation, and the safety of personnel. Appropriate instrument shutdown features should also be included, if necessary to maintain a safe working environment.